Hydrotherapy for post-cerebrovascular accident (cva) patient

Hydrotherapy, in its broadest term, is the use of any one of the varying forms of water (i. e. liquid, ice or steam) to facilitate either a specific treatment, or to aid with overall health promotion (Mooventhan & Nivethitha, 2014). One systematic review (Geytenbeek, 2002) looked at some of the available literature regarding the effectiveness of various hydrotherapy treatments. The review found that the majority of the research available was focused primarily on musculoskeletal conditions and concluded there was little research that was pertinent to the use of hydrotherapy in the specific treatment of neurological pathologies. However, since this systematic review was published there have been numerous pieces of research that do have a primary focus on the benefits of liquid-based hydrotherapy interventions for the treatment of neurological disorders. This literature review will aim to evaluate the current available evidence, with a specific focus being on the effectiveness of those hydrotherapeutic interventions that have the purpose of improving balance, quality of life and gait re-education in post-cerebrovascular accident (CVA) patients.

The term CVA would be more commonly recognised as a ‘ Stroke’ and it can be medically defined as an interruption of the blood supply to a specific area of the brain (WHO, 2017). The region of cerebral tissue that has been affected by this interruption will largely dictate both the severity of the CVA and the symptoms that are then suffered by the patient. Water-based interventions have been used for hundreds of years for both pain relief and to treat numerous pathologies. It was Vincent Priessnitz however, who is credited as the founder of modern hydrotherapy after opening the first hydropathy clinic in Gräfenberg, Czech Republic in 1826 (Metcalfe, 1898).

Since then a greater understanding of the effects of hydrotherapy has been developed, in particular the numerous physiological changes that can occur during submersion in water. For example, submersion up to the sternal notch is now known to cause an increase in cardiac output and stroke volume, which can then further increase alongside a rise in the water temperature (Grady, 2013).

With this in mind the search strategy for this literature review was to include the terms ‘ cerebrovascular accident’, ‘ CVA’ and ‘ stroke’, and then also ‘ hydrotherapy’, ‘ aquatic therapy’ and ‘ water based therapy’ with a date limitation set to only include research published since 2008. The search was conducted using the databases ‘ AMED’, ‘ CINAHL’, ‘ Medline’ and ‘ Medline with full text’ and returned 51 results when searching for linked full text only. There were several duplicate journals in the results and those remaining included various different types of research from across the hierarchy of evidence, ranging from case studies to randomised control trials. Seven journals were selected from the search results as the only publications that specifically focused on hydrotherapy interventions for the treatment of post-CVA patients (see Appendix A) and this literature review will therefore seek to critically evaluate these and summarise any common findings.

In order to successfully validate a hypothesis it is important that the research clearly identifies which hydrotherapeutic intervention is being tested and also the control intervention that is being used for comparison. Three of the seven journals that were selected (Noh et al., 2008; Tripp & Krakow, 2014; Park et al., 2016) used Halliwick Therapy as their primary intervention and then land-based physiotherapeutic programmes as the

control group. The Halliwick concept was initially designed to help teach disabled children how to swim and is a ten-point programme that has a heavy focus on mental adjustment and body control within the water (Gresswell, 2015). This initial concept has then been further developed into Halliwick Aquatic Therapy, which has a holistic approach to neurorehabilitation that uses the support provided by the water to increase confidence in the patient and therefore also increase their participation in the exercise programme. The exercises themselves are designed to improve postural control and reduce muscle stiffness, with the overall aim to facilitate motor re-learning that can then be translated to on-land functional tasks (Weber-Nowakowska et al., 2011). This specificity of Halliwick Therapy, with regards to functional rehabilitation for neurological disorders, makes it ideally suited as a therapeutic intervention in such cases, however, only one of the papers listed above (Tripp & Krakow, 2014) applied a specific functional outcome measure to their results.

Another hydrotherapy technique that was used in one of the reviewed papers (Cappadocia et al., 2016) is known as the Bad Ragaz Ring Method. This utilises ring shaped floating devices that are typically placed around the patients neck, pelvis and peripheral joints, such as elbows and knees. The therapist is then able to fix their own position and use the peripheral limbs as levers to facilitate the patient’s trunk muscles and to encourage increased range of movement in the peripheral joints (Dutton, 2012). Unlike Halliwick Therapy this method does not have a focus on the transference of any benefits gained into more functional tasks. Instead it uses proprioceptive neuromuscular facilitation (PNF) techniques to enhance the patient’s active

and passive range of movement and this can then hopefully be transferred into a more functional neuromuscular pattern of movement.